

WHAT IS CLAIMED IS:

1. An apparatus comprising:
a carousel rotationally coupled to a base; and
a plurality of assembly stations including a merge station having a merge tool
to merge heads or head suspension assemblies of a data storage device
proximate to discs and the carousel being rotatable relative to the
plurality of assembly stations.
2. The apparatus of claim 1 wherein the plurality of assembly stations include a
load/unload station and the carousel is rotatable between the load/unload station
and the merge station.
3. The apparatus of claim 2 wherein the plurality of assembly stations include a
premerge station between the load/unload station and the merge station and the
premerge station includes a pre-merge cam assembly to preposition head suspension
assemblies of the data storage device for merge operations.
4. The apparatus of claim 2 wherein the plurality of assembly stations include a
post-merge station between the merge station and the load/unload station and the
post-merge station includes a gripper assembly to remove a shipping comb of the
head suspension assemblies.
5. The apparatus of claim 1 wherein the carousel includes a plurality of assembly
nests and the merge tool is compliantly supported between a raised position and a
lowered position proximate to the carousel and the merge tool includes at least one
pin insertable into a datum socket or opening of the plurality of assembly nests.

6. The apparatus of claim 5 wherein the datum socket or opening is formed between three rollers or bearings to provide an adjustable interface between the merge tool and the plurality of assembly nests.
7. The apparatus of claim 5 wherein the datum socket or opening is formed between opposed spaced rollers or bearings to provide an axially adjustable interface between the merge tool and the plurality of assembly nests.
8. The apparatus of claim 1 wherein the carousel includes a plurality of assembly nests including a plurality of nest pads and the merge tool includes a plurality of nest balls which mate with nest pads on the plurality of assembly nests.
9. The apparatus of claim 1 wherein the merge tool includes a merge head including a plurality of merge fingers or spreaders to engage the heads or the head suspension assemblies to merge the heads or the head suspension assemblies relative to the discs.
10. The apparatus of claim 9 wherein the merge head includes a yoke portion rotationally coupled to the merge head and spring biased relative to the plurality of merge fingers or spreaders and the apparatus including a yoke latch assembly to restrict rotation of the yoke portion during merge operations.
11. The apparatus of claim 1 wherein the apparatus includes a machine vision system using an image of the heads or head suspension assemblies area prior to or following merge operation .

12. The apparatus of claim 11 wherein the machine vision system measures one of comb angle or position, head suspension angle or position, comb presence or latch position .
13. A rotatable carousel including a plurality of assembly nests comprising:
a nest cavity formed relative to edge surfaces of a nest body; and
at least one finger cantilevered relative to the nest cavity of the plurality of assembly nests and rotatable therewith to engage a workpiece securable in the nest cavity.
14. The rotatable carousel of claim 13 wherein the workpiece includes a hydrodynamic spindle assembly and the at least one finger includes a spring biased tip portion positioned to provide a biasing force relative to the spindle assembly of the workpiece.
15. The rotatable carousel of claim 13 wherein the at least one finger is movably coupled relative to the nest body of the plurality of assembly nest and is actuatable via a cam assembly to position the at least one finger to engage the workpiece insertable into the nest cavity.
16. The rotatable carousel of claim 15 wherein the workpiece is a data storage device and including opposed fingers coupled to a positioning arm actuatable by the cam assembly to position a head suspension assembly or assemblies for merge operation.

17. The rotatable carousel of claim 13 wherein the plurality of assembly nests include a nest plate forming the nest body and the nest plate is removably coupled to the rotatable carousel.
18. An assembly apparatus comprising:
- a conveyor;
 - a rotatable carousel; and
 - a lift operable between a retracted position proximate to the conveyor and a raised position proximate to the carousel to load workpieces from the conveyor onto the rotatable carousel and unload workpieces from the rotatable carousel to the conveyor.
19. The assembly apparatus of claim 18 wherein the carousel rotates between a plurality of assembly stations including a load/unload station and a merge station.
20. The assembly apparatus of claim 19 wherein the merge station includes a merge tool to merge heads or head suspension assemblies relative to discs of the workpiece.
21. The assembly apparatus of claim 18 wherein the rotatable carousel includes a plurality of assembly nests configured to support the workpieces therein.
22. The assembly apparatus of claim 21 wherein the plurality of assembly nests include opposed latch assemblies operable between a retracted unlatched position to load the workpieces and an extended latched position.

23. A method comprising steps of:
energizing a lift assembly to load a workpiece from a conveyor onto a
carousel; and
rotating the carousel to position the workpiece for assembly.
24. The method of claim 23 wherein the step of rotating the carousel rotates the
carousel to a merge station and comprising the step of:
energizing a merge tool to merge heads or head suspension assemblies
relative to discs of the workpiece.
25. The method of claim 24 and comprising the step of:
supplying a biasing force relative to a disc spindle assembly to align the discs
for merge operations.
26. The method of claim 24 and comprising the step of:
providing vision alignment based upon an image of a region of the workpiece
prior to or following merge operations of the merge tool to locate one of
a comb, head suspension assembly, latch assembly or positioning or
clocking arm.